



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,490	12/05/2003	Mark T. Anderson	58623US002	9748

32692 7590 10/22/2007  
3M INNOVATIVE PROPERTIES COMPANY  
PO BOX 33427  
ST. PAUL, MN 55133-3427

EXAMINER
----------

CHACKO DAVIS, DABORAH

ART UNIT	PAPER NUMBER
----------	--------------

1795

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

10/22/2007

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LegalUSDocketing@mmm.com  
LegalDocketing@mmm.com

## Office Action Summary

Application No.

10/728,490

Applicant(s)

ANDERSON ET AL.

Examiner

Daborah Chacko-Davis

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.138(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>08/07</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-27, and 36-38, are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 2004/0012872 (Fleming et al., hereinafter referred to as Fleming).

Fleming, in the abstract, in [0019], [0020], [0021], [0022], [0027], [0060], [0076], [0188], discloses a method of providing a photoreactive composition that is substantially inorganic, exposing the photoreactive composition to a multibeam exposure process (multi beam of at least four beams, and multiphoton reactive radiation, pulsed IR laser) so as to form reacted and non-reacted portions of the photoreactive composition to form a three-dimensional pattern (of exposed and unexposed areas), developing the photoreactive composition (remove reacted portions or non-reacted portions, remove exposed or unexposed areas with a solvent or chemical etching) to form a periodic pattern (interstitial void space of submicron dimensions) (claims 1-3, 8, 23-27, 36, and 38). Fleming, in [0179], discloses that the photoreactive composition is further subjected to heating, causing the facilitation of dissolution of certain components and

Art Unit: 1795

the dissipation of volatile components and therefore losses less than 60 percent of the its initial weight (upon irradiation and heating) (claims 5, and 37). Fleming, in [0028], and [0074], discloses that the photoreactive composition includes reactive species such as curable organic species, a photoinitiator, and inorganic particles such as siloxanes (claims 4, 6-7). Fleming, in [0028], [0108], [0124], [0134], discloses a photoinitiator that includes a multiphoton photosensitizer, an electron donors such as amines, and electron acceptors such as iodonium salts or triazines (claims 9-10, and 15-16). Fleming, in [0099], discloses that the photon absorption of the multi-photon photosensitizer is greater than that of the fluorescein (claim 11-12). Fleming, in [0110], discloses that the multi-photon photosensitizer (with a large multi-photon absorption cross-section) in the photoreactive composition is Rhodamine B (claims 13-14). Fleming, in [0134], discloses that the photoreactive composition includes metal fluorides (metal complexes such as oxides) that are later irradiated during exposure (claims 17-22).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 28-35, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 2004/0012872 (Fleming et al., hereinafter referred to as Fleming) in

view of U. S. Patent Application Publication No. 2004/0198582 (Borrelli et al., hereinafter referred to as Borrelli).

Fleming is discussed in paragraph no. 2.

Fleming, in [0021], [0022], [0027], [0060], [0076], [0188], discloses removing reacted or unreacted (or both) portions of the photoreactive composition after exposure processes by developing or etching (claims 30-31).

The difference between the claims and Fleming is that Fleming does not disclose that the three-dimensional structures (interstitial voids) formed are deposited with a semiconductor material as recited in claims 28, 29, 32-35).

Borrelli, in [0040], discloses that the three-dimensional gratings are filled with silica (different refractive index than the grating) and then surface treated by heating in a furnace.

Therefore, it would be obvious to a skilled artisan to modify Fleming by employing the method of depositing the claimed material on the gratings as suggested by Borrelli, because Fleming, in [0002], discloses that the three-dimensional patterns (gratings) are formed using the multi-photon method, and Borrelli, in [0008], teaches using the method for forming glass based optical elements that has desired refractive index material in the voids (pattern grooves).

### ***Double Patenting***

5. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis

added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

6. Claims 1-38, are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-35 of copending Application No. 10/596,186. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

### ***Response to Arguments***

7. Applicant's arguments filed February 2, 2007, have been fully considered but they are not persuasive. The 102 and 103 rejections made in the previous office action (paper no. 20061002) are maintained.

A) Applicants argue that Fleming does not teach a substantially inorganic photoreactive composition, and cites paragraph nos. [0073] to [0096], and Example 8, as Fleming's disclosure of the photoreactive composition.

The claim recites a substantially inorganic photoreactive composition . The cited portions in question are not the only disclosure suggesting a photoreactive composition. Fleming discloses a photoreactive composition that includes electron donor compounds that include ammonium salts and photoinitiators such as metal complex salts (see paragraph nos. [0124], and [0134]) and are therefore substantially inorganic.

B) Applicants argue that Fleming does not teach a substantially inorganic photoreactive composition, that upon photoreaction and pyrolysis, loses less than about 80 percent of its initial weight.

The amended portions of claims 1, and 38, recite,  
providing a substantially inorganic photoreactive composition, said substantially inorganic photoreactive composition being a photoreactive composition that, upon photoreaction and pyrolysis, loses less than 80 percent of its initial weight;  
providing a substantially inorganic photoreactive composition, said substantially inorganic photoreactive composition being a photoreactive composition that, upon photoreaction and pyrolysis, loses less than 80 percent of its initial weight, and said substantially inorganic photoreactive composition comprising

The claims do not recite "loses less than about 80% of its initial weight". The claims recite "loses less than 80% of its initial weight. Fleming, in [0179], discloses that the photoreactive composition is further subjected to optional heating, that causes the facilitation of dissolution of certain components and the dissipation of volatile components and therefore losses less than 80 percent of the its initial weight (upon irradiation and heating). Dissipating volatile components from the composition via heating will cause a decrease in weight in the composition from its initial weight.

Art Unit: 1795

C) Applicants argue that Fleming does not suggest the use of multi-beam interference technique to expose a substantially inorganic photoreactive composition.

See paragraph no. A. Fleming in [0022], and [0064], discloses that the photoreactive composition is exposed in an exposure system using optical interference from the three or more light beams i.e., the photoreactive composition is exposed via multi-beam interference (MBI technique).

D) Applicants argue that Fleming does not teach a development step or a removal step and that Borrelli does not disclose a deposition step.

Fleming in [0060] discloses that once the patterns of interference of coherent light is formed, the desired surface profile is formed either by etching or using a composition that is a developable photopolymer (i.e., after exposure it undergoes development), or through laser ablation (removal of undesired portions). Borrelli, in [0040], teaches that the gratings are covered with silica and heat treated thus causing the deposition of the silica material in the gratings of the sample.

### ***Conclusion***

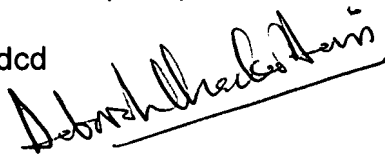
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.



Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

  
October 15, 2007